



## Appendix A

3. A pharmaceutical preparation for tolerization comprising a pharmaceutically acceptable carrier and

an amount of an isolated human polypeptide effective for tolerizing an individual to an autoantigen, said human polypeptide consisting essentially of an amino acid sequence corresponding to the core MHC binding residues of a sequence motif for an HLA-DR protein;

wherein said sequence motif for said HLA-DR protein is based upon the structure of the HLA-DR binding site;

wherein said HLA-DR protein is associated with a human autoimmune disease;

wherein said polypeptide binds to said HLA-DR protein;

wherein said polypeptide bound to said HLA-DR protein activates autoreactive T cells from a subject having said autoimmune disease; and

wherein said polypeptide is a non-collagen and non-myelin basic protein polypeptide.

4. The pharmaceutical preparation of claim 3 wherein said HLA-DR protein is an HLA-DR4 protein and said autoimmune disease is pemphigus vulgaris.

5. The pharmaceutical preparation of claim 4 wherein said motif is PV motif #1.

6. The pharmaceutical preparation of claim 4 wherein said amino acid sequence consists essentially of an amino acid sequence selected from the group consisting of SEQ ID NO.: 1, SEQ ID NO.: 2, SEQ ID NO.: 3, SEQ ID NO.: 4, SEQ ID NO.: 5, SEQ ID NO.: 6, and SEQ ID NO.:

7.

11. A method of tolerizing an individual to an autoantigen of pemphigus vulgaris comprising

administering an effective amount of the pharmaceutical preparation of any one of claims 4-6 to a subject in need of such treatment.

13. A pharmaceutical preparation for vaccinating an individual at risk of an autoimmune disease comprising a pharmaceutically acceptable carrier and

an amount of an immunogenic preparation effective to immunize against a human pathogen that in its native form includes a polypeptide having an amino acid sequence corresponding to the core MHC binding residues of a sequence motif for an HLA-DR protein;

wherein said sequence motif for said HLA-DR protein is based upon the structure of the HLA -DR binding site

wherein said HLA-DR protein is associated with said autoimmune disease;

wherein said polypeptide binds to said HLA-DR protein;

wherein said polypeptide bound to said HLA-DR protein activates autoreactive T cells from a subject having said autoimmune disease; and

wherein said preparation is free of a polypeptide corresponding to said sequence.

14. The pharmaceutical preparation of claim 13 wherein said HLA-DR protein is an HLA-DR4 protein and said autoimmune disease is pemphigus vulgaris.

15. The pharmaceutical preparation of claim 14 wherein said motif is PV motif #1.

16. The pharmaceutical preparation of claim 14 wherein said amino acid sequence consists essentially of an amino acid sequence selected from the group consisting of SEQ ID NO.: 1, SEQ ID NO.: 2, SEQ ID NO.: 3, SEQ ID NO.: 4, SEQ ID NO.: 5, SEQ ID NO.: 6, and SEQ ID NO.: 7.